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| 10/039,558 | 01/08/2002 | Jiang-Jen Lin | 12724 B | 1316 |

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| EXAMINER |
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WYROZEBSKI LEE, KATARZYNA I

| ART UNIT | PAPER NUMBER |
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1714

DATE MAILED: 10/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/039,558 | LIN ET AL. | |
| | Examiner | Art Unit | |
| | Katarzyna Wyrozebski Lee | 1714 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

In view of the claims 1 and 7 the examiner has an understanding that the polyoxyalkylene amine compound, that is intercalated in between the clay platelet, during the intercalation process is initially a salt of an amine, since as claim 7 indicates polyoxyalkylene amine undergoes cation exchange with the clay component. In order for clay and inorganic compound to undergo cation exchange, both components have to have cationic character.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-15 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for intercalation of talc, does not reasonably provide enablement for how applicants were able to achieve intercalation of compound that does not have layered structure. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to arrive at a talc-amine complex, wherein the talc exhibits interlayer spacing the invention commensurate in scope with these claims.

In the present claims the applicant claim a complex between polyoxyalkylene amine and clay. In the same claims the applicants state that clay can be talc and in a separate claim the

Art Unit: 1714

applicant state that the interlayer spacing of the clay component is 50-92 angstroms. It is well known (see Condensed chemical Dictionary) that talc not have layered structure and therefore will not have interlayer distances as present invention claims. If a complex can be formed between talc and amine it will be that on the surface of talc. The applicants have not provided any description, which would help person skilled in the art to arrive at intercalated talc.

Claim Objections

3. Claims 4 and 8 are objected to because of the following informalities: Talc is not clay.

Appropriate correction is required.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Art Unit: 1714

5. Claims 1-13 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-11 of copending Application No. 10/029727 ('727). Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following explanation.

Co-pending application '727 discloses complex of polyoxyalkylene amine grafted polypropylene. It is obtained by polymerizing polyoxyalkylene amine and grafting polypropylene with maleic anhydride.

Further claims of '727 disclose that the amine is selected from polyoxypropylene diamine, polyoxyethylene diamine and copolymers thereof.

Clay is selected from montmorillonite, mica, kaolin and talc and has cation exchange capacity of 50-200 meq/100 grams.

According to the process the amine is treated with inorganic acid to afford cation exchange.

Although the present invention does not disclose polypropylene modified with maleic anhydride, it does not exclude its presence as well. In addition utilizing the present invention of ordinary skill in the art would obtain the polyoxyalkylene amine complex with clay. In addition, generic disclosure of polyoxyalkylene polymers encompasses its various forms and modification.

In the light of the above disclosure, it would have been obvious to one having ordinary skill in the art at the time of the present invention to utilize the claims of co-pending application '727 and thereby arrive at present claims.

Art Unit: 1714

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 5-9, 12-15 are rejected under 35 U.S.C. 102(b) as being anticipated by BARBEE (US 6,071,988).

The prior art of BARBEE discloses process for making polyester nanocomposites, which comprises inorganic clay treated with at least one polyalkoxylated ammonium salt.

According to example 1 (col. 8) of the prior art of BARBEE, the intercalated clay is prepared by following methods: Sodium montmorillonite having cation exchange capacity of 95 meq/100 grams) was incorporated into water at 60°C. Next ammonium compound of octadecyl methyl bis(polyoxyethylene[15] ammonium chloride in amount of 14.5 miliequivalents or 10 mole % excess were added. The mixture was blended at high speed, solids were removed by filtration and final intercalate exhibited basal spacing of 3.4 nanometers (equivalent of 34

Art Unit: 1714

angstroms). Example 2 further indicates that the hydrochloric acid was used to acidify amine and thereby form ammonium compound capable of cation exchange.

Specification further discloses that the silicate utilized in the prior art of BARBEE is any type of smectite clay besides already named montmorillonite such as mica, bentonite and the like (col. 3, lines 1-28). In the mentioned paragraph BARBEE also discloses that the cation exchange capacity of the clays utilized in nanocomposites is in a range of 50-200 meq/100 grams.

Specification of BARBEE further enables one of ordinary skill to utilize other oligomeric polyalkoxylated compounds in place of that utilized in the example 1 described above (col. 4, lines 1-44). The cationic compound is utilized in amount of 0.1-25.0% by weight of composition and it can have as much as 200 repeat alkoxy units in a chain (claims 1-3). The ammonium compounds are salts, which in turn are also surfactants.

The complex of BARBEE is extruded into articles with matrix polymer such as polyester (col. 7, lines 59-60).

In view of the above disclosure, the prior art of BARBE anticipates the requirements of claims rejected above.

8. Claims 1, 3-15 are rejected under 35 U.S.C. 102(a) as being anticipated by LAN (US 6,225,394).

The prior art of LAN discloses composition for nanocomposite comprising organically modified clay.

Art Unit: 1714

According to the prior art of LAN the clay component can be any phyllosilicate having layered structure. The layered silicate of LAN as taught by the specification of the prior art includes montmorillonite clay (See examples). The cation exchange capacity of the montmorillonite clay is 95 meq/100 grams.

The ammonium cation to be intercalated into the clay component includes polyalkoxylated compounds having chemical formula 4 (col. 12) and well as multicharged ammonium compound such as that of formula 2 (col. 9). According to the specification, the ammonium compound can be propoxylated or ethoxylated or both (col. 9, lines 55-62). The ammonium compounds are salts, which in turn are also surfactants.

The complex of LAN was formed according to example 1 disclosed in col. 24 of this prior art: Montmorillonite clay was dispersed in deionized water and mixed. Next polyalkoxylated amine compound was added followed by the treatment with 2N aqueous solution of hydrochloric acid followed by vigorous mixing. Dried material had interlayer spacing of 26 angstroms. The ammonium compound is added in excess of cation exchange capacity of clay component.

The complex of the prior art of LAN is utilized in articles by extrusion with matrix polymers such as thermoplastics or thermosetting.

Art Unit: 1714

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 1714

12. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over BARBEE (US 6,071,988).

In addition to the disclosure in paragraph 7 of this office action the prior art of BARBEE renders claim 2 of the present invention as obvious for the following reasons.

The basal spacing of the clay platelets depends not only on the shear action that is applied to the clay during mixing but also the amount and the size of the intercalant. In the examples provided by the prior art of BARBEE when additional intercalant such as polyester resin is added to the modified clay the spacing between the clay platelets is no less than 45 angstrom (example 4 and 5).

Basically the more intercalating polymer one of ordinary skill in the art incorporates into the clay component the bigger the interlayer spacing will be.

In the light of the above disclosure, it would have been obvious to one having ordinary skill in the art at the time of the instant invention, that in order to obtain clay with interlayer spacing of 50 angstroms or more, one would have to utilize bigger intercalating agent and thereby obtain the claimed invention.

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over LAN (US 6,225,394).

In addition to the disclosure in paragraph 8 of this office action the prior art of LAN renders claim 2 of the present invention as obvious for the following reasons.

The basal spacing of the clay platelets depends not only on the shear action that is applied to the clay during mixing but also the amount and the size of the intercalant. When additional

Art Unit: 1714

intercalant or intercalant having higher molecular weight is added to the modified clay the spacing between the clay platelets will increased as evidenced in the prior art of BARBEE applied against present claims.

Basically the more intercalating polymer one of ordinary skill in the art incorporates into the clay component the bigger the interlayer spacing will be.

In the light of the above disclosure, it would have been obvious to one having ordinary skill in the art at the time of the instant invention, that in order to obtain clay with interlayer spacing of 50 angstroms or more, one would have to utilize bigger intercalating agent and thereby obtain the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katarzyna Wyrozebski Lee whose telephone number is (703) 306-5875. The examiner can normally be reached on Mon-Thurs 6:30 AM-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (703) 306-2777. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Primary Examiner
October 6, 2003